

AS

THE UNIVERSITY OF CHICAGO

- 105557-020504
1. (Amended) A combinatorial screening apparatus comprising:
 - a) a cell body containing a fluid inlet;
 - b) a fluid permeable, conductive, catalyst array support positioned adjacent to the cell body, said catalyst array support having multiple locations for supporting solids;
 - c) a catalyst mask positioned adjacent to the catalyst array support, said catalyst mask [having material removed to form] defining holes [where the holes are] arranged in alignment with the multiple locations for supporting solids of the catalyst array support; and
 - d) a cell cover positioned adjacent to the catalyst array support, said cell cover [having material removed to allow] defining an opening for monitoring of the solids.
 3. (Amended) The apparatus of Claim 1 further comprising a [gas] diffuser positioned between the catalyst array support and fluid inlet of the cell body.
 13. (Amended) A combinatorial screening apparatus comprising:
 - a) a catalyst array support backing;
 - b) a conductive catalyst array support positioned adjacent to the support backing, said catalyst array support having multiple locations for supporting solids;
 - c) a catalyst mask positioned adjacent to the catalyst array support, said catalyst mask [having material removed to form] defining holes [where the holes are] arranged in alignment with the multiple locations for supporting solids of the catalyst array support; and
 - d) a cell cover positioned adjacent to the catalyst array support, said cell cover [having material removed to allow] defining an opening for monitoring of the solids.
 17. (Amended) A method for screening an array of solids for electrocatalytic activity comprising:
 - a) depositing the solids of the array on a catalyst array support;

- b) placing a catalyst mask over the catalyst array support, said mask [having material removed to form] defining holes [where the holes are] arranged in the same pattern as the solids of the array;
- c) contacting the array of solids on the catalyst array support masked by the catalyst mask with a reagent fluid and a fluid containing an ion concentration indicator;
- d) applying a potential to the catalyst array support;
- e) applying excitation radiation to said catalyst array support;
- f) measuring emission radiation emitting through the holes of the catalyst mask; and
- g) determining electrocatalytic activity of the solids in the array from the emission radiation measurements.

25. (Amended) A bulk catalyst testing apparatus comprising:

- a) a bulk cell body containing a first and a second fluid inlet and a first and a second fluid outlet;
- b) a fluid permeable bulk catalyst support structure having a catalyst thereon positioned adjacent to the bulk cell body and in alignment with the first fluid inlet and the first fluid outlet of the bulk cell body; and
- c) a bulk cell cover positioned adjacent to the bulk catalyst support structure, said bulk cell cover [having material removed] defining a cavity to allow for fluid contact with the catalyst and monitoring of the catalyst.